

Ishihara discloses a honeycomb structure for use as exhaust gas filters for internal combustion engines where the porosity of the cell walls is 55% and the porosity of the plugs is 70%. See Ishihara, Table 1, Samples 7-9 and 13-15. Shaffer discloses that the lower density (i.e., higher porosity) of a ceramic material contributes to a lower Young's Modulus and a higher thermal shock resistance. See Shaffer at column 3, lines 46-48. The Office Action, at page 3, asserts that it stands to reason that when the porosity of the plugs is higher than that of the cell walls, the Young's Modulus of the plugs is lower than that of the cell walls. Thus, the Office Action asserts that Ishihara, in view of Shaffer, discloses a honeycomb structure having "a Young's modulus of the plugging material [that] is lower than that of the cell wall, [and] a porosity of the plugging material is 105% or more with respect to a porosity of the cell wall." Applicants respectfully disagree.

Applicants respectfully submit that the Young's Modulus of a material is not necessarily a function of the porosity of the material. In fact, other factors, such as particle size of the material and auxiliary agent, affect the Young's Modulus. As such, an ordinarily skilled artisan would have recognized that the higher porosity of the plugs in Ishihara does not necessarily result in a lower Young's Modulus of the plugs, as compared to the cell walls. Thus, Ishihara and Shaffer do not disclose a honeycomb structure where "a Young's modulus of the plugging material is lower than that of the cell wall, [and] a porosity of the plugging material is 105% or more with respect to a porosity of the cell wall."

Additionally, contrary to the Office Action's assertion above, Shaffer discloses that the Young's Modulus increases as porosity increases. See Appendix (demonstrating that an increase in Percent Theoretical Density results in an increase in Young's Modulus in the samples tested in Shaffer). Thus, an ordinarily skilled artisan would not have modified the honeycomb structure of Ishihara in view of Shaffer to achieve the claimed honeycomb

structure where the plugging material has a Young's Modulus that is lower and a porosity that is higher with respect to the cell wall.

Hamanaka fails to cure deficiencies of Ishihara and Shaffer because Hamanaka does not disclose a plugging material having a Young's Modulus that is lower and a porosity that is higher with respect to the cell wall. Furthermore, an ordinarily skilled artisan would not have had any reason or rationale to combine Ishihara and Hamanaka for at least the following reasons.

The plugging material of claim 1 "plugs" (i.e., fills) predetermined cells at one end face and "plugs" remaining cells at the other end face. In contrast, Hamanaka discloses a honeycomb structure constructed from a plurality of honeycomb cells, where the honeycomb cells are bonded together by fillers. See Hamanaka, Figures 1(a) and 1(b). Because the filler of Hamanaka is used to bond a plurality of honeycomb cells, rather than fill the honeycomb cells, an ordinarily skilled artisan would not have had any reason or rationale to modify Ishihara's honeycomb structure using Hamanaka's bonding fillers to achieve the claimed honeycomb structure.

Furthermore, the June 3, 2009 Office Action, at page 10, has considered and found persuasive our arguments with respect to Hamanaka in our November 28, 2008 Amendment, reproduced below for convenience.

[T]he Office Action acknowledges that Hamanaka is silent regarding the porosity of the plugging material relative to the cell wall. Additionally, Hamanaka teaches that the filler material must be present with a slit that is only partially filled with filler to form a gap. Specifically, paragraph [0024] of Hamanaka indicates that the gap is necessary to prevent the generation of cracks even when non-uniform temperature distribution arises in various portions of the filter. Hamanaka does not teach that prevention of cracks may be accomplished with the filler substance alone.

Thus, the June 3, 2009 Office Action has already recognized that Hamanaka would not have rendered obvious claim 1.

For at least these reasons, the applied references would not have rendered obvious claim 1. Claims 4, 6, 8, 24 and 25 depend from claim 1 and, thus, also would not have been rendered obvious by the applied references for at least the same reasons. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

B. Ichikawa, Shaffer, and Hamanaka

The Office Action rejects claims 1, 4, 6, 8, 24 and 25 under 35 U.S.C. §103(a) as having been obvious over U.S. Patent No. 5,595,581 to Ichikawa et al. ("Ichikawa"), as evidenced by Shaffer, in view of Hamanaka. Applicants respectfully traverse the rejection.

Similar to Ishihara, the Office Action applies Ichikawa as a background reference disclosing a honeycomb structure for use in an exhaust gas filter. Deficiencies of Shaffer and Hamanaka with respect to claim 1 are discussed above. Ichikawa does not cure deficiencies of Shaffer and Hamanaka with respect to claim 1.

Thus, the applied references would not have rendered obvious claim 1. Claims 4, 6, 8, 24 and 25 depend from claim 1 and, thus, also would not have been rendered obvious by the applied references for at least the same reasons. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

C. Hijikata, Shaffer, and Ichikawa

The Office Action rejects claims 1, 4, 6, 8, 24 and 25 under 35 U.S.C. §103(a) as having been obvious over WO 2002/081880 to Hijikata et al. ("Hijikata"), as evidenced by Shaffer, in view of Ichikawa. Applicants respectfully traverse the rejection.

Similar to Ishihara and Ichikawa, the Office Action applies Hijikata as a background reference disclosing a honeycomb structure for use in an exhaust gas filter. Deficiencies of

Ichikawa and Shaffer with respect to claim 1 are discussed above. Ichikawa does not cure deficiencies of Ichikawa and Shaffer with respect to claim 1.

Thus, the applied references would not have rendered obvious claim 1. Claims 4, 6, 8, 24 and 25 depend from claim 1 and, thus, also would not have been rendered obvious by the applied references for at least the same reasons. Accordingly, reconsideration and withdrawal of the rejection are respectfully requested.

II. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of the claims are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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Attachments:

Appendix

Petition for Extension of Time

Date: March 1, 2010

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<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry of this filing; Charge any fee due to our Deposit Account No. 15-0461</p>

APPENDIX

	*1 Percent Theoretical Density (%)	*1 Young's Modulus $\times 10^6$ (psi)	*2 Young's Modulus (GPa)
I-1	86.5	8.2	56.5
I-2	84.1	6.3	43.4
I-3	88.4	9.8	67.6
I-4	89.4	8.7	60
I-5	91	9.3	64.1
I-6	73.6	3.6	24.8
I-7	92	10.8	74.5
I-8	83.8	5.94	41
I-9	87.8	8.93	61.6
I-10	90.9	10.9	75.2
C-1	89	11.3	77.9
C-2	90	9.2	63.4
C-3	97.2	13.34	92

*1: Data from Table B

*2: Data from Table D

